KAL314 Series

Fujian Kwise Generator Co., Ltd.

200kW - 360 kW

Application and Standard

The4-pole generator is suitable for matching with a reciprocating internal combustion engine (commonly called a diesel engine) to form a generator set, which can be used as a fixed power supply or backup power supply for national defense, post and telecommunications, airports, hospitals, buildings, oil exploration，Industrial and mining enterprises and other departments.

Alternators are incompliance to the main domestic and international standards and regulations: GB755, BS5000, IEC60034, VDE0530, CSAC22.2-100, NEMAMG-1.22. Alternators' manufacturing, design and mark are carried out in the environment of ISO9001.

Electrical features

Automatic voltage regulators: Kwise 4 Pole Alternators are fitted with reliable and performant AVR, adapted to excitation systems, powered by transistors and fulfilling perfect regulation.

Short circuit capacity: Kwise propose two choices of excitation systems to meet different customer requirements:

A）Self-Excitation system, without short-circuit capacity.

B）PMG, with a short-circuit capacity of 3 times of the nominal current for 10seconds.

Transient features: Transient voltage dip for 60% rated current at 0.4 power factor is less than 15%. Recovery time for a 15% transient voltage dip is less than 1.5s.

Parallel operation: All 4 pole alternators can operate in parallel with other alternators or with the mains, when they are equipped with the appropriate devices (AVR, current transformer...).

Overload acceptance: 4 pole alternators can be overloaded according to NEMA.

Single-phase operation: 314 series 4 pole alternators can be connected for single phase use.

Waveform: Total harmonic distortion(THD), at no load or linear load is less than 5% according to IEC. Telephone influence factor (TIF) according to NEMA is less than 50.

Frequency: 4 pole alternators may operate either 50Hz or 60Hz. The standard winding (B31, B32) is suitable both for 50Hz and 60Hz.

Power factor: 4 pole alternators are designed to operate between 0.8 and 1.0 power factor. A derating is necessary below 0.8 power factor (see derating table).

Mechanical features

Forms: 4 pole alternators can be provided in single bearing or double bearing configurations according to customer's requirements, as well as Engine adaptors and coupling discs which are fit for the major engines.

Balancing: All the rotors are dynamically balanced according to ISO1940. Double bearing rotors are balanced with a half key.

Insulation and protection: 4 pole alternators are class H insulated. The standard winding protection can accept up to 95% relative humidity and is suitable in the cabins. Specific added coatings can be proposed for harsh environments.

Enclosure: Standard enclosure is IP23.

Direction of rotation: 314 series can operate in both directions.

Terminal box and connectors: 4 pole alternators have a terminal box which allows easy access for connection of AVR or reconnection. Current transformers or other optional modules can be fitted with in the box.

Bearings: Sealed for life bearings up to all Kwise 4 pole alternator.

Overs peed: The maximum overspeed is 2250rpm for the 4 pole alternator (1.25 times the 60Hz rated speed).

Mechanical structure: Steel frame. Cast iron or steel housing and flanges depending on models.

General parameters

Ambient temperature	40℃	Temperature rise	125K	Short circuit current multiple	/
Altitude	1000m	Voltage regulation	±1%	Cooling method	IC01
Insulation class	Class H	Exciter system	Brushless self-excitation	Direction of rotation	Clockwise
Duty type	S1	Winding pitch	2/3	Maximum speed	2250rpm
Phases	3	Power factor	0.8	Protection grade	IP23
Number of poles	4	TIF	<50	Frequency	50/60Hz
AVR model	SX440	THF	<2%	THD	1.2%~2.5%

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4 Poles

Kwise from the CASIC, to the world

Electrical parameters

50Hz/1500RPM		Standard Winding / Power Factor 0.8							
Dutytype/Temperature rise/Ambient		Cont./125K/40℃				Standby/163K/27℃			
Phase		3-Phases				3-Phases			
Voltage	Y	380V	**400V**	415V	440V	380V	400V	415V	440V
	Δ	220V	**230V**	240V		220V	230V	240V	
	YY*				220V				220V
KAL314A1	kVA	250	**250**	250	238	280	280	280	261
	kW	200	**200**	200	190	224	224	224	209
KAL314B1	kVA	275	**275**	275	261	308	308	308	287
	kW	220	**220**	220	209	246	246	246	230
KAL314C2	kVA	300	**300**	300	285	336	336	336	314
	kW	240	**240**	240	228	269	269	269	251
KAL314D2	kVA	313	**313**	313	297	350	350	350	327
	kW	250	**250**	250	238	280	280	280	261
KAL314E2	kVA	325	**325**	325	309	364	364	364	340
	kW	260	**260**	260	247	291	291	291	272
KAL314F3	kVA	350	**350**	350	333	392	392	392	366
	kW	280	**280**	280	266	314	314	314	293
KAL314G3	kVA	375	**375**	375	356	420	420	420	392
	kW	300	**300**	300	285	336	336	336	314
KAL314H4	kVA	400	**400**	400	380	448	448	448	418
	kW	320	**320**	320	304	358	358	358	334
KAL314K5	kVA	450	**450**	450	428	504	504	504	470
	kW	360	**360**	360	342	403	403	403	376

*** Only12-wire alternator can be realized, other voltages please consult the factory.**

KWISE

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4 Poles

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Electrical parameters

60Hz/1800RPM		Standard Winding / Power Factor 0.8							
Duty type/Temperature rise/Ambient		Cont./125K/40℃				Standby/163K/27℃			
Phase		3-Phases				3-Phases			
Voltage	Y	416V	**440V**	460V	480V	416V	440V	460V	480V
	Δ	240V				240V			
	YY*	208V	**220V**	230V	240V	208V	220V	230V	240V
KAL314A1	kVA	269	**288**	300	300	296	316	330	330
	kW	215	**230**	240	240	237	253	264	264
KAL314B1	kVA	296	**316**	330	330	325	348	363	363
	kW	237	**253**	264	264	260	278	290	290
KAL314C2	kVA	323	**345**	360	360	355	380	396	396
	kW	258	**276**	288	288	284	304	317	317
KAL314D2	kVA	336	**359**	375	375	370	395	413	413
	kW	269	**288**	300	300	296	316	330	330
KAL314E2	kVA	349	**374**	390	390	384	411	429	429
	kW	280	**299**	312	312	307	329	343	343
KAL314F3	kVA	376	**403**	420	420	414	443	462	462
	kW	301	**322**	336	336	331	354	370	370
KAL314G3	kVA	403	**431**	450	450	443	474	495	495
	kW	323	**345**	360	360	355	380	396	396
KAL314H4	kVA	430	**460**	480	480	473	506	528	528
	kW	344	**368**	384	384	378	405	422	422
KAL314K5	kVA	484	**518**	540	540	532	569	594	594
	kW	387	**414**	432	432	426	455	475	475

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Moment of Inertia & Efficiency

Model	KAL314	A1	B1	C2	D2	E2	F3	G3	H4	K5
Inertia (1-Bearing) J	kgm^2	3.469	3.745	3.941	4.225	4.206	4.628	4.962	5.439	6.071
50Hz400V Efficiency (100% load)	%	94.1	94.5	94.4	94.5	94.5	94.7	94.7	94.8	94.9
60Hz440V Efficiency (100% load)	%	94.3	94.6	94.4	94.6	94.6	94.9	94.9	94.9	94.7

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4 Poles

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Reactance (%) - Time Constant (ms)

50Hz @ 400V	KAL314	A1	B1	C2	D2	E2	F3	G3	H4	K5
Short circuit ratio	Kcc	0.24	0.22	0.25	0.24	0.22	0.25	0.23	0.25	0.24
Direct axis synchronous unsaturated reactance	Xd	418	462	393	424	455	401	431	399	418
Direct Axis Transient Saturation Reactance	X'd	27.9	31.9	25.5	27.3	29.2	26.8	27.7	25.0	27.9
Direct Axis Subtransient Saturation Reactance	X"d	18.8	21.8	16.9	18.1	19.3	17.9	18.2	16.2	18.8
Quadrature axis Synchronous Unsaturated Reactance	Xq	240	265	225	243	261	230	247	228	240
Quadrature Subtransient Saturation Reactance	X"q	24.9	27.9	22.5	24.1	25.7	23.1	24.0	21.8	24.9
Negative sequence saturation reactance	X2	2.19	2.49	1.97	2.11	2.25	2.05	2.11	1.90	2.19
Zero sequence unsaturated reactance	X0	1.22	1.44	1.00	1.06	1.11	1.08	1.03	0.85	1.22
Short-circuit transient time constant	T'd	103	111	84	88	93	79	80	68	103
Subtransient time constant	T"d	13	14	11	11	12	10	10	9	13
Open circuit time constant	T'do	4283	4475	3604	3807	4011	3274	3471	3036	4283
Armature time constant	Ta	32	46	41	43	47	58	56	59	32

60Hz @ 440V	KAL314	A1	B1	C2	D2	E2	F3	G3	H4	K5
Short circuit ratio	Kcc	0.22	0.18	0.21	0.20	0.18	0.21	0.19	0.21	0.19
Direct axis synchronous unsaturated reactance	Xd	462	549	468	504	541	477	534	475	524
Direct Axis Transient Saturation Reactance	X'd	31.9	38.0	30.3	32.5	34.8	31.9	34.1	29.7	33.1
Direct Axis Subtransient Saturation Reactance	X"d	21.8	25.9	20.1	21.5	23.0	21.3	22.4	19.3	21.4
Quadrature axis Synchronous Unsaturated Reactance	Xq	265	316	268	289	310	274	306	273	296
Quadrature Subtransient Saturation Reactance	X"q	27.9	33.3	26.8	28.7	30.6	27.5	29.5	25.9	28.5
Negative sequence saturation reactance	X2	2.49	2.96	2.35	2.51	2.68	2.44	2.59	2.26	2.49
Zero sequence unsaturated reactance	X0	1.44	1.72	1.19	1.26	1.32	1.29	1.25	1.01	1.15
Short-circuit transient time constant	T'd	111	110	83	88	92	78	80	67	80
Subtransient time constant	T"d	14	14	10	11	11	10	10	8	10
Open circuit time constant	T'do	4475	5326	4289	4530	4773	3897	4191	3613	4091
Armature time constant	Ta	43	45	40	42	46	58	59	55	60

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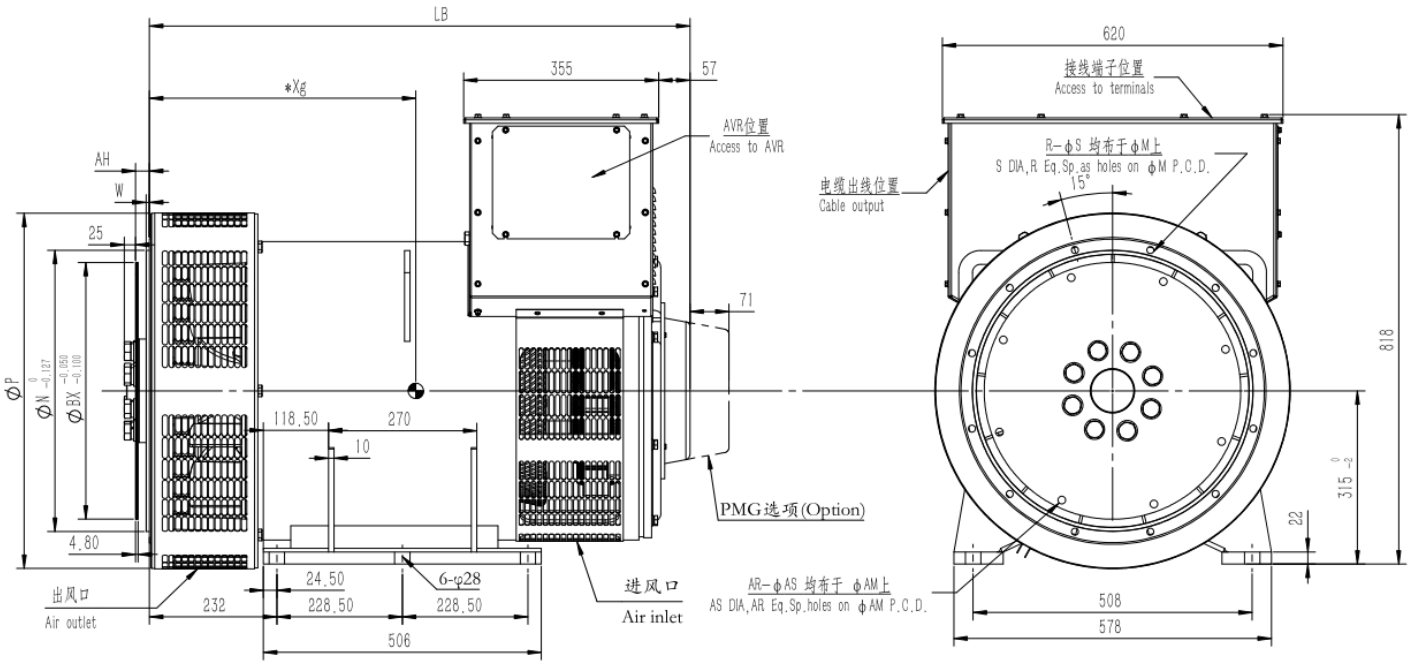
4 Poles

Kwise from the CASIC, to the world

Outline Drawing (Single Bearing)



Dimension(mm)				
TYPE	LB	*Xg	Weight	Package
	mm	mm	kg	L x W x H(mm)
KAL314A1	886	395	660	960*786*1060
KAL314B1	886	408	702	960*786*1060
KAL314C2	936	423	741	1010*786*1060
KAL314D2	936	428	759	1010*786*1060
KAL314E2	936	433	721	1010*786*1060
KAL314F3	986	453	783	1090*786*1060
KAL314G3	986	458	801	1090*786*1060
KAL314H4	1021	475	875	1090*786*1060
KAL314K5	1081	505	983	1150*786*1060

Flange (mm)						
S.A.E	P	N	M	R-øS	W	a°
#0	711	647.7	679.45	16-ø14	6	11.25°
#1/2	646	584.2	619.125	12-ø14	6	15°
#1	646	511.175	530.225	12-ø12	6	15°

Coupling Disc (mm)				
S.A.E	BX	AM	AR-øAS	AH
#11.5	352.425	333.38	8-ø11	39.6
#14	466.725	438.15	8-ø14	25.4
#18	571.5	542.925	6-ø17	15.7

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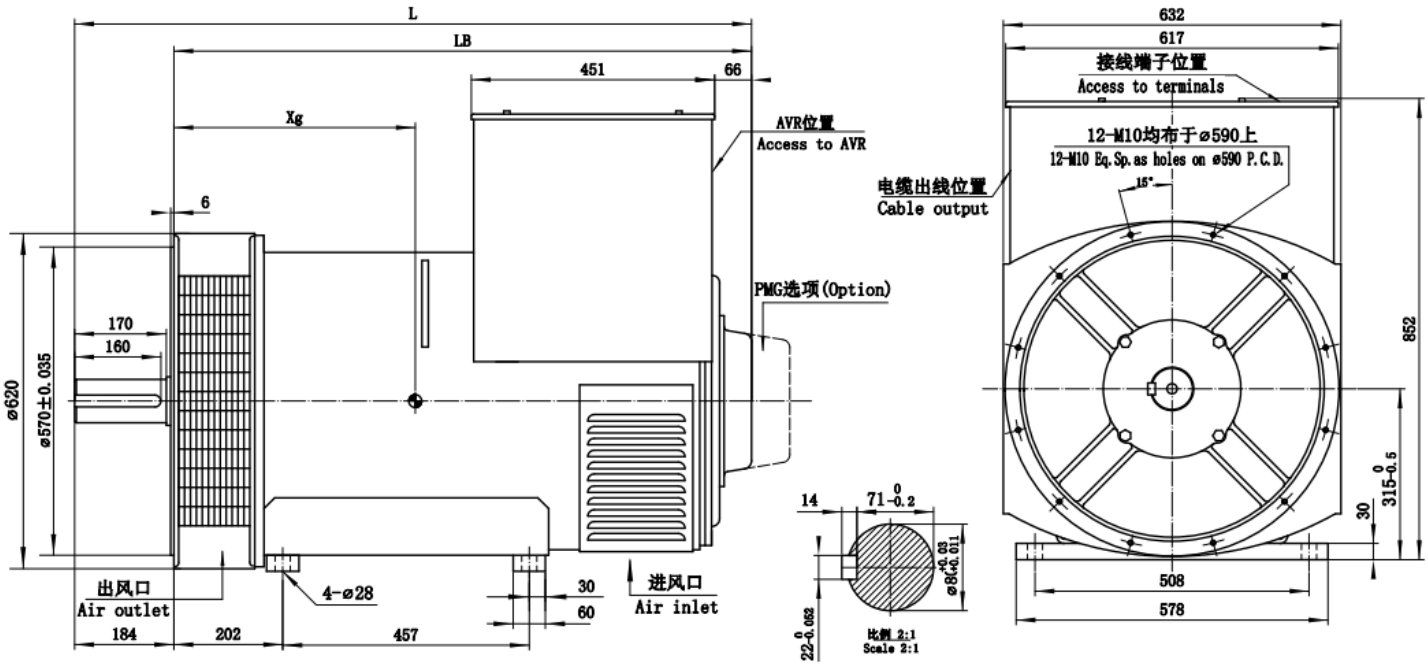
4 Poles

Kwise from the CASIC, to the world

Outline Drawing (Double Bearing)



Dimension (mm)					
TYPE	L	LB	*Xg	Weight	Package
	mm	mm	mm	kg	L x W x H(mm)
KAL314A1	1255	1071	433	675	1050*786*1040
KAL314B1	1255	1071	442	717	1050*786*1040
KAL314C2	1255	1071	453	756	1100*786*1040
KAL314D2	1255	1071	465	774	1100*786*1040
KAL314E2	1255	1071	474	736	1100*786*1040
KAL314F3	1255	1071	485	798	1180*786*1040
KAL314G3	1345	1071	500	816	1180*786*1040
KAL314H4	1345	1161	512	890	1180*786*1040
KAL314K5	1345	1161	528	998	1240*786*1040